



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/797,761	03/10/2004	Roger F. Buelow II	2510	4240
7617	7590	07/20/2005		
BRUZGA & ASSOCIATES 11 BROADWAY, STE 400 NEW YORK, NY 10004			EXAMINER STEIN, JAMES D	
			ART UNIT 2874	PAPER NUMBER

DATE MAILED: 07/20/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/797,761	BUELOW ET AL. <i>GW</i>	
	Examiner	Art Unit	
	James D. Stein	2874	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on _____.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) 23-29 is/are allowed.
- 6) Claim(s) 1-17 is/are rejected.
- 7) Claim(s) 18-22 is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 10 March 2004 is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 0604.
- 4) Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) Notice of Informal Patent Application (PTO-152)
- 6) Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicant's admitted prior art [USPAT 5,579,429] to Naum, and further in view of [USPAT 6,536,993] to Imamura et al., both of which disclose related light pipes with side-light emission.

With regard to claim 1, Fig. 4 of Naum shows a light pipe 64 with uniform side-light emission 74 comprising a polymer core 68 (entire document and col. 13 line 54, Teflon is a well-known polymer) and a fluoropolymer cladding 70 (FEP, col. 10 lines 43-46) on the core 68; and a light-scattering material 72 distributed within the core 68 along an active section of the light pipe 64 in which side-light emission is desired (in this case, the segment of light pipe shown in the figure); the light scattering material being distributed along the core 68 with a density gradient chosen to achieve uniform side-light emission (abstract, col. 3 lines 30-35, col. 10 lines 4-5, col. 9 lines 51-55). It is noted to applicant that yielding uniform side-light emission as taught by Naum inherently requires a corresponding density gradient of the light-scattering material to be chosen, as the concentration gradient of the scattering material is related to the uniformity of the side-light emission 74 (fig. 3A, col. 10 lines 4-32).

Therefore, Naum discloses the claimed invention except for the refractive index of the cladding to be less than that of the core. It is extremely well-known in the art that the cladding of a light pipe should be less than that of the core in order to guide light down the length of the pipe, as is taught in the Imamura reference (col. 4 line 65 and 44). Therefore, it would have been obvious at the time of the invention to one of ordinary skill in the art to ensure the refractive index of the cladding 70 was less than that of the core 68 in order to guide light down the pipe and achieve uniform side light emission along the entire length of the pipe.

With regard to claim 2, in addition to the rejection of claim 1 previously discussed above, Naum discloses the light-scattering particles to be titanium dioxide (col. 4 line 64 col. 9 lines 43-45, col. 10 line 8, etc.).

Claims 3-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over [USPAT 6,536,993] to Imamura et al. and further in view of [EP 0 841 151] to Abramowicz et al, which disclose related light pipe with side-light emission.

With regard to claim 3, fig. 1 of Imamura et al. shows a light pipe with side-light emission comprising a core 3 comprising a polymer (col. 4 line 34-35) and a fluoropolymer cladding 2 (col. 4 lines 57-65) on the core; the cladding having a lower refractive index (1.34-1.43, col. 4 line 65) than the core (1.5, col. 4 line 44); and light-scattering material 1 distributed within the cladding 2 along an active section of light pipe in which side-light emission is desired; the light-scattering material being distributed in the cladding along the active section of the light pipe, substantially only in a radial swath (see fig. 1, col. 5 line 50-53), along the longitudinal axis of the light pipe, of substantially

less than 360 degrees. It is noted to applicant that the span of the light-scattering material is distributed in approximately a 90-degree swath as shown in fig. 1.

Therefore, Imamura et al. disclose the claimed invention except for the light to preferentially exit the light pipe from the radial swath, in fact the complement of that occurs in the Imamura et al. reference; light exits the light pipe through the cladding in the area where the light-scattering radial swath is *not* present (col. 5 lines 15-25).

Abramowicz et al. disclose a related side-light emitting pipe with a polymer core and a flouropolymer cladding containing a light scattering material (abstract, page 4 line 28 discusses titanium dioxide) wherein light is emitted through the cladding of the light pipe. It would have been obvious at the time of the invention to one of ordinary skill in the art to modify the light pipe as disclosed by Imamura et al. such that the light-scattering material in the radial swath emitted light, as taught by Abramowicz et al., rather than blocked light. In this case, the light would exit through a smaller area and be more easily managed and directed to a target area. Less scattering material would be necessary to achieve this, resulting in a less costly and simpler manufacturing process of the side-light emitting pipe.

With regard to claims 4-6, in addition to the rejection of claim 3 previously discussed above, fig. 1 of shows the radial swath to be about 90 degrees or slightly less, which is less than 180 degrees and more than 10 degrees. Furthermore, it would have been obvious at the time of the invention to one of ordinary skill in the art to chose a radial swath within any range; depending on the amount of emitted site-light required for a specific application. It has been held that discovering an optimum or working range involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Claims 7-17 are rejected over Imamura-Abramowicz as applied in the rejection of claim 3 previously discussed above, and further in view of the Naum reference.

With regard to claims 8 and 13, in addition to the rejection of claim 3 previously discussed above, Naum discloses that uniform side light emission is desirable in illumination applications (abstract, col. 3 lines 30-35, col. 10 lines 4-5, col. 9 lines 51-55). It is noted to applicant that yielding uniform side-light emission as taught by Naum inherently requires a corresponding density gradient of the light-scattering material to be chosen, as the concentration gradient of the light-scattering material is related to the uniformity of the side-light emission (fig. 3A, col. 10 lines 4-32). Therefore, it would have been obvious at the time of the invention to one of ordinary skill in the art to ensure that the density gradient of the light-scattering material is chosen to yield uniform light emission because the density gradient of the light-scattering material is related to uniformity of the side light emission, and uniform side-light emission is desirable in illumination applications.

With regard to claims 7, 12 and 17, in addition to the rejection of claims 3 and 8 previously discussed above, the claimed invention has been disclosed and previously discussed above except for the lumen output as between the inlet and output portions of the active section is within plus or minus 10 percent of the average value of each other; which would be inherent to a light pipe with uniform side-light emission. As was discussed above, Naum discloses the advantage of uniform side-light emission in illumination applications. Therefore, it would have been obvious at the time of the invention to one of ordinary skill in the art to ensure the lumen output as between the inlet and output portions of the active section is within plus or minus 10 percent of the

average value of each other because such a light-pipe would be uniformly side-light, which is taught by Naum to be desireable in illumination applications.

With regard to claims 9-11 and 14-16, in addition to the rejection of claims 8 and 9 previously discussed above, fig. 1 of shows the radial swath to be about 90 degrees or slightly less, which is less than 180 degrees and more than 10 degrees. Furthermore, it would have been obvious at the time of the invention to one of ordinary skill in the art to chose a radial swath within any range; depending on the amount of emitted site-light required for a specific application. It has been held that discovering an optimum or working range involves only routine skill in the art. In re Aller, 105 USPQ 233.

Allowable Subject Matter

Claims 23-29 are allowed.

Claims 18-22 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

None of the cited prior art discloses or suggests the light-pipe with uniform side-light emission further comprising light-scattering material being distributed in the core of the light pipe, substantially only in a radial swath along the longitudinal axis of the pipe, of substantially less than 360 degrees (or 180 degrees), so that light exits the light pipe from the radial swath. The most relevant prior art, the Naum reference, discloses a light-scattering material distributed throughout the entire core along the longitudinal axis of the light pipe, rather than just a radial swath. The Imamura et al. reference, which is also relevant, discloses a light scattering material distributed in the cladding of a light pipe in a radial swath (about 90 degrees or less) along the longitudinal axis of the fiber.

However, there is no suggestion or motivation in these references to distribute a light-scattering material within a radial swath of substantially less than 360 degrees (or 180 degrees) in the core of a light pipe along the longitudinal axis of the pipe. Therefore, the claimed subject matter is allowable over the prior art.

Conclusion

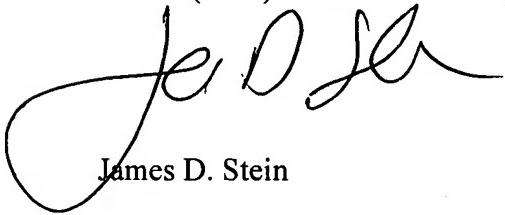
The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: [WO 02/052314] to Irie, [WO 98/08024] to Hongisto et al., [USPAT 6,154,595] to Yokogawa et al., and [USPAT 5,937,127] to Zarian et al., which disclose related light pipes with side-light emission.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

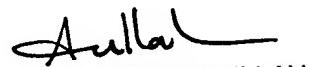
Any inquiry concerning this communication or earlier communications from the examiner should be directed to James D. Stein whose telephone number is (571) 272-2132. The examiner can normally be reached on M-F (8:00am-4:30pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney Bovernick can be reached on (571) 272-2344. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



James D. Stein



Akmal
AKM ENAYET ULLAH
PRIMARY EXAMINER